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# Model of resistance for a symmetrical four-tooth-shaped microstrip antenna

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## Abstract

© 2018, Institute of Advanced Scientific Research, Inc. All rights reserved. A symmetrical microstrip four-tooth-shaped antenna is considered. A detailed description of configuration of such antennas is given. Dependence of resistance for the four-tooth-shaped antenna on geometric parameters of its radiator is investigated. Numerical experiments are conducted for investigating the dependences. In total, 174 antennas are considered, which differ from each other in parameters of the radiator. Length, width of the radiator and depth of rectangular lateral cutouts in the radiator are selected as geometric parameters of the microstrip antenna's radiator. Based on the results of numerical experiments, graphs of dependences of resistance at the base frequency on depth of the cutouts are drawn. Regression analysis is carried out, and three mathematical models of resistance of the antenna for individual values of the radiator width are developed. Transformations are made with respect to depth of the cutouts for different lengths of the radiator during development of the models. As a result, a new parameter is obtained that represents transformed depths of the cutouts. The developed models connect resistance with this parameter. Absolute and relative errors for each model are calculated. At the next step, the developed models are combined into one general (single) model, for which the errors are also determined. The mathematical models proposed in this article can be used both in the design of a symmetrical four-tooth-shaped microstrip antenna and in improving the performance of the electrical characteristics of a particular tooth-shaped antenna.

## Keywords

Base frequency, Four-tooth-shaped microstrip antenna, Radiator geometry, Regression model, Resistance

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